

CLAIMS

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is as follows:

- 1 1. A method of estimating customer arrival times at a terminal,
2 comprising the steps of:
3 extracting service time data from the terminal;
4 grouping customers into busy periods; and
5 estimating customer arrival times for each busy period based on
6 said extracted service time.
- 1 2. The method of claim 1, further comprising:
2 constructing a queue length for each busy period; and
3 calculating queue performance measures based on the
4 constructed queue lengths.
- 1 3. The method of claim 1, further comprising:
2 outputting the calculated performance measures for analysis.
- 1 4. The method of claim 1, wherein the terminal is a point-of-sale
2 (POS) terminal.
- 1 5. The method of claim 4, wherein there are a plurality of POS
2 terminals and the method is performed for each of the plurality of POS
3 terminals to generate queue performance measures for each of said POS
4 terminals.

1 6. The method of claim 5, further comprising the step of
2 outputting the generated performance measures for each POS terminal for
3 analysis.

1 7. An apparatus for estimating dynamic queue lengths of
2 customers at a terminal comprising:
3 extraction means for extracting service time data from the terminal;
4 a storage device for storing extracted service time data; and
5 a processor retrieving stored data from the storage device and grouping
6 customers into busy periods, estimating customer arrivals for each busy
7 period, constructing a queue length for each busy period, and calculating
8 queue performance measures based on the constructed queue lengths.

1 8. The apparatus of claim 7, further comprising:
2 output means for outputting the calculated queue performance
3 measures for analysis.

1 9. The apparatus of claim 7, wherein the terminal is a point-of-
2 sale (POS) terminal.

1 10. The apparatus of claim 9, wherein there are a plurality of POS
2 terminals, said extracting means extracting data from each of the plurality of
3 POS terminals and storing the data in the storage device, and the processor
4 retrieving and separately processing the data for each POS terminal stored in
5 the storage device to generate queue performance measures for each of said
6 POS terminals.

- 1 11. The apparatus of claim 10, further comprising:
2 output means for outputting the generated queue performance
3 measures for analysis.

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